A NEW SPECIES OF *POLYRHACHIS* (*POLYRHACHIS*) FROM PAPUA NEW GUINEA WITH A REVIEW OF THE NEW GUINEAN AND AUSTRALIAN SPECIES (HYMENOPTERA: FORMICIDAE: FORMICINAE)

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New Guinea and Australian species of the subgenus *Polyrhachis* of the genus *Polyrhachis* Fr. Smith are reviewed. *P. erosispina* Emery is reinstated from synonymy, raised to specific status, and compared with *P. bellicosa* Fr. Smith. An apparent case of a character displacement observed in these species is discussed. *P. taylori* sp. nov. is described from the Torricelli Mountains, Papua New Guinea. Workers and females of all three species are illustrated. Observations on nesting habits and distribution within Papua New Guinea are included.

□ *Formicidae, Polyrhachis (Polyrhachis), New Guinea, Australia, new species, biology, distribution.*

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Subgenus *Polyrhachis* of the genus *Polyrhachis* Fr. Smith was revised by Hung (1970). He noted high levels of variability in some species, especially in *P. bellicosa* Fr. Smith, and considered this evidence of a chaotic conglomerate of individual and local variants "without any stable type to be followed". Hung synonymised all but one of the previously described infraspecific taxa, and recognised seven species as *bona fide* members of the subgenus. His system recognised *P. bellicosa* Fr. Smith as the only valid species present in Papua New Guinea.

I visited mainland Papua New Guinea and various adjacent islands in July, August and September, 1984 (with permission of the Conservator of Fauna, Department of Physical Planning and Environment, Port Moresby), to collect and observe *Polyrhachis* species in their natural environments. Special attention was given to nesting habits and distribution, and because much effort was made to locate nests, many previously unknown associations of workers with queens were established. This study is presented as the first in a series of papers dealing with the results of this trip.

The illustrations were drawn with the use of a Zeiss (Oberkochen) SR Steromicroscope and camera lucida. Where possible type material was used for this purpose. Because the holotype of *P. bellicosa* and the syntypes of *P. erosispina* are damaged on their mesosomal dorsa by mounting pins, details of their illustrations are based partly on additional, confidently identified specimens which resembled the types in all relevant details. The females illustrated for both species were chosen from colonies with workers confidently identified by type-comparison. The figures of *P. taylori* sp. nov. depict the holotype and a nidoparatype female, which has been appropriately labelled. The micrographs were prepared with a Hitachi S-530 Scanning Electron Microscope using uncoated specimens.

The following conventions for measurements and indices are used: TL — Total length (the necessarily composite measurement of the entire ant). HL — Head length (the maximum measurable length of the head in perfect full face view, measured from the anteriormost point of the clypeal border or teeth, to the posteriormost point of the occipital margin). HW — Head width (the width of the head in perfect full face view, measured immediately in front of eyes). CI — Cephalic index (HW × 100/ HL). SL — Scape length (the length of the antennal scape, excluding the condyla). SI — Scape index (SL × 100/ HW). PW — Pronotal width (the width of the pronotal dorsum measured at the bases of the pronotal spines, or across the humeri in species without spines). MTL — Metathoracic tibial length (the maximum measurable length of the tibia of the hind leg). PeH — Petiolar height (measured from the petiolar spiracle to the tangent point of the petiolar hook, in lateral view). PeI — Petiolar index (PeH × 100/ HL).

Abbreviations for institutions and depositories are those of Taylor and Brown (1985), with the following additions: ZIK — Zoological Institute of the Academy of Sciences, Ukrainian SSR, Kiev. RJK — R.J. Kohout, Brisbane (accessions and private collection data).

Polyrhachis bellicosa Fr. Smith
(Fig. 1 A,B,C,D,E,F; Fig. 2 A,B,C; Fig. 3 A,B,D,E)

Polyrhachis bellicosus Fr. Smith, 1859: 142. Holotype worker. INDONESIA: Aru Is. (A.R. Wallace), OUM (Examined).

Polyrhachis (*Polyrhachis*) *bellicosa* Fr. Smith; Hung, 1970: 5 (in part).

DIMENSIONS OF HOLOTYPE

TL 8.98; HL 2.06; HW 1.75; CI 85; (antennae missing); PW 1.03; MTL 3.65; PeH 1.78; PeI 86.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA, NORTHERN PROV.: Owen Stanley Ra., 500 m, Mamba c. 7 km WNW of Kokoda, 08.51 S × 147.41E, 31 Aug.-1 Sept. 1984, RJK acc. 84.403. CENTRAL PROV.: 25 km NE of Sogeri, Musgrave Riv., 25.x.1984, T. Mala; Tapini, 1000–1100m, 18.v.1961, J.L. & M. Gressitt. MOROBE PROV.: nr. Wampit, c .50 m, c. 35 km W of Lae, 06.45 S × 146.40E, 24. & 27. Aug. 1984, RJK acc. 84.345, 365, 377; Lae, < 50m, 17 June 1972, R.W. Taylor acc. 72.371; Mindik, 1200–1600m, ix.1968, N.L.H. Krauss. CHIMBU PROV.: Keglsugl, 2600 m, 13.xiii.1969, J.L. Gressitt. MANDANG PROV.: Wanuma, viii.1968, N.L.H. Krauss. EAST SEPIK PROV.: Angoram, 10m, 13.viii.1969, J.L. Gressitt; Dreikikir, 350–400m, 23.vi.1961, J.L. & M. Gressitt. WEST SEPIK PROV.: Torricelli Mts., Lumi, 400–550m, 03.28 S × 142.02E, 4–13 Aug. 1984, RJK acc. 84.243, 260, 284; ditto, Oct. 1984, D. Waisi; Pes Mission, < 50m, c.12 km WSW of Aitape, 03.11 S × 142.15 E, 31 July — 3 Aug. 1984, RJK acc. 206. NEW BRITAIN PROV.: Gazelle Penins., Baining Mts., nr. Gaulim, c. 150 m, 04.28 S × 152.07 E, 13 July 1984, RJK acc. 84.52, 58, 59; c. 12 km SW of Vudal Agric. College, c. 200 m, 04.25 S × 151.57 E, 15 July 1984, RJK acc. 84.83. INDONESIA, WEST IRIAN: Nabire, S of Geelvink Bay, 1–20m, 2–9 July 1962, J.L. Gressitt. PHILIPPINES, MINDANAO: Agusan, 10 km SE S. Francisco, 12 Nov. 1959, Quate & Yoshimoto. AUSTRALIA, QUEENSLAND: Cape York Penins., Iron Range, 12.43 S × 143.18 E, 26–31 July 1981, RJK acc. 81/138, 216; ditto, 1–3 July 1976, P. Filewood; West Claudie River, Iron Range, 3–10 Dec. 1985, G.B. Monteith & D. Cook; Bamaga, nr. tip of Cape York, 10.53 S × 142.23 E, 18 March 1987, RJK acc. 87.3.

DIMENSIONS

Workers: TL 7.30–8.52; HL 1.80–2.12; HW 1.56–1.96; CI 83–97; SL 2.27–2.72; SI 132–154; PW 0.86–1.01; MTL 3.07–3.68; PeH 1.64–2.07; PeI 87–98 (50 workers measured).

Females: TL 9.77–10.08; HL 2.12–2.22; HW 1.56–1.66; CI 74–76; SL 2.95–3.02; SI 181–189; PW 1.41–1.51; MTL 3.93–4.03; PeH 1.11–1.21; PeI 51–57 (10 females measured).

There are two forms of the petiolar column in workers of *P. bellicosa*, as indicated in the accompanying illustrations. The holotype exhibits the least common of these, in which the anterior section at the immediate base of the spines is swollen (Fig. 1 A,C). Petiolar segments of such structure are rare among other specimens (e.g. Fig. 3 B,E). Only a small percentage of workers in any particular population show this remarkable configuration, and specimens intermediate to the more usual unswollen condition (Fig. 3 A,D) are uncommon. The swollen condition has been observed in populations of *P. bellicosa* from various parts of Papua New Guinea, *but* only where this species is sympatric with its closely related counterpart, *P. erosispina*.

The preceding was first perceived during field studies, and has been subsequently confirmed for other areas using previously collected material. It is obviously repeated under the same circumstances of contact with *erosispina* in populations of *P. bellicosa* in eastern Indonesia and in the Philippines. A worker of *P. bellicosa* with a swollen petiole was, for example, discovered in material containing both species from Nabire, Irian Jaya. Presence of the phenomenon on Aru Island is confirmed by the holotype itself, and documentation of the presence of *P. erosispina* by Karawajew (1927). The Philippine record is from Mindanao, where a worker with swollen node was collected with 'normal' specimens at the same locality as another undescribed species of the subgenus — a species closely related both to *bellicosa* and *erosispina*.

On the other hand, I have never observed the swollen petiolar condition in Australian populations of *P. bellicosa* despite careful examination of many hundreds of specimens. I believe this to be significantly correlated with the *absence* of any other closely related species in Australia. Indeed, no other species of subgenus (*Polyrhachis*), whether related to *bellicosa* or not, is known from that continent. It is unfortunate, from the taxonomic point of view, that this remarkable feature is relatively rare, for it is the most constant and reliable character identifying

P. bellicosa, even when other characters fail to distinguish the species from sympatric *erosispina* specimens (see, for example, fig. 3 A,B,C,D,E,F).

P. bellicosa was redescribed at length by Hung (1970) and details are not repeated here. The principal characters separating it from *P. erosispina* are given in the *erosispina* discussion below.

Polyrhachis erosispina Emery,
1900 Stat. nov.
(Fig. 1 G,H,I; Fig. 2 D,E,F; Fig. 3 C,F)

Polyrhachis bellicosa var. *erosispina* Emery, 1900: 713 (footnote). Syntype workers. NEW GUINEA: Ramoi (Beccari), INDONESIA: Celebes, Kandari (Beccari), MCG (Examined).

Polyrhachis (*Polyrhachis*) *bellicosa* Fr. Smith: Hung, 1970: 5 (in part).

LECTOTYPE SELECTION

I have examined three syntypes from the Emery Collection, kindly loaned by Dr R. Poggi of the Museo Civico di Storia Naturale, Genoa. Two of these bear identical locality labels reading "N. Guinea, Ramoi, II.1875, Beccari". One of them is here designated the *lectotype*. The specimen is in fair condition and bears three additional labels as follows: "*P. bellicosa* var. *erosispina* Emery" (in Emery's handwriting), "Syntypus" (printed on a red tag) and "Collezione Emery" (on a yellow tag). The second specimen, and a third, which bears the locality label "Celebes, Kandari, III.74., O. Beccari", are here designated as *paralectotypes*.

DIMENSIONS

Lectotype cited first: TL 9.07, 8.01–9.37; HL 2.18, 2.02–2.39; HW 1.93, 1.69–2.09; CI 89, 82–91; SL 2.81, 2.52–3.02; SI 146, 135–150; PW 1.15, 0.93–1.16; MTL 3.69, 3.43–4.08; PeH 2.09, 1.81–2.17; PeI 96, 84–97 (3 measured).

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA, NORTHERN PROV.: Owen Stanley Ra., 500m, Mamba c. 7 km WNW of Kokoda, 08.51 S × 147.41 E, 31 Aug.-1 Sept. 1984, RJK acc. 84.403; Pongani River, c. 500m, Boikiki Plant., c. 8 km NNE of Afore, 09.06 S × 148.25 E, 29–30 Aug. 1984, RJK acc. 84.382, 386; Kokoda, 400 m, 22.iii.1956, J.L. Gressitt; Keparra-Sengi, nr. Kokoda, 500m, 26.iii.1956, J.L. Gressitt; Cape Killerton, 0–5m, 6–13.v.1965, W.A. Steffan. CENTRAL PROV.: Mamai Estate, 60m, 17.ii.1965, P. Shanahan; Iongai, 1450m, 9 Nov. 1965, J. Sedlacek; Nunumai via Amazon Bay, July 1969, R. Pullen. GULF PROV.: Murua River, 0–3m, 17–18 Dec. 1964, J. Sedlacek. WESTERN PROV.: Oriomo Govt. Station, 26–28.x.1960, J.L. Gressitt. MOROBE PROV.: nr. Wampit, c. 50m, c. 35 km W of Lae, 06.45 S × 146.40 E, 24 & 27 Aug. 1984, RJK acc. 84.345, 348, 349, 350, 353, 365; Sarawaget Ra., 1000–1200m, 3 km E of Gain, 06.25 S × 146.46 E, 26 Aug. 1984, RJK acc. 84.363; Etep, 600–700m, ix.1968, N.L.H. Krauss; Kalalo, 750m, 20–30 Aug. 1966, G.A. Samuelson; Bulolo, March 1935, F.H. Taylor. MADANG PROV.: Wanuma, viii.1968, N.L.H. Krauss; Karkar I., Kurum, 100 m, viii.1968, N.L.H. Krauss. EAST SEPIK PROV.: c. 2–3 km S of Wirui, S of Wewak, 50-100m, 03.36 S × 143.37 E, 8 Aug. 1984, RJK acc. 84.256; Bainyik, nr. Maprik, 225m, 20–21.vi.1961, J.L. Gressitt; Angoram, 10 m, 13 Aug. 1969, J.L. Gressitt. WEST SEPIK PROV.: Torricelli Mts., Lumi, 400–550m, 03.28 S × 142.02 E, 4–13 Aug. 1984, RJK acc. 84.223, 228, 243, 248, 249, 267, 279, 284, 286; ditto, Oct. 1984, D. Waisi; Pes Mission, < 50m, c. 12 km WSW of Aitape, 03.11 S × 142.15 E, 31 July–3 Aug. 1984, RJK acc. 84.160; Oenake Range, 200-300m, c. 10 km WNW of Vanimo, 03.40 S × 141.12 E, 15 Aug. 1984, RJK acc. 84.288. NEW BRITAIN PROV.: Gazelle Penins., Baining Mts., c. 600 m, c. 3 km N of Malasait, 04.26 S × 151.53 E, 11 July 1984, RJK acc. 84.22. INDONESIA, WEST IRIAN: Nabire, S of Geelvink Bay, 1–20 m, 1–9 July 1962, J.L. Gressitt; Vogelkop, Fakfak, S coast of Bomberai, 10–100m, 10.vi.1959, T.C. Maa; Nabire, 10–40m, S of Geelvink Bay, 2.x.1962, H. Holtmann; Ifar, 400–450 m, 27 June 1962, J.L. Gressitt; Ifar, Cyclops Mts., 300–500m, 28–30.vi.1962, J.L. Gressitt.

DIMENSIONS

Workers: TL 8.01–9.39; HL 2.02–2.39; HW 1.69–2.09; CI 82–90; SL 2.52–3.02; SI 135–150; PW 0.93–1.16; MTL 3.43–4.08; PeH 1.81–2.07; PeI 84–95 (50 workers measured).

Females: TL 10.98–12.14; HL 2.52–2.72; HW 2.07–2.32; CI 80–85; SL 3.38–3:78; SI 156–176; PW 1.56–1.79; MTL 4.23–4.69; PeH 1.16–1.41; PeI 43–51 (20 females measured).

P. erosispina is closely similar to *P. bellicosa* and it seems likely that both have been derived from the same ancestral species. At localities where they are sympatric, morphological and ecological differences are somewhat accentuated and more distinct than those observed in allopatric situations, in which distinctions can become very tenuous. This seems to represent a case of *character displacement* (Brown and Wilson, 1956).

The females of both species are easily recognisable by their relative size and the shape of the head and petiole (Fig. 2 A–F). The workers, as indicated, are very variable, and, while they are

Fig. 1

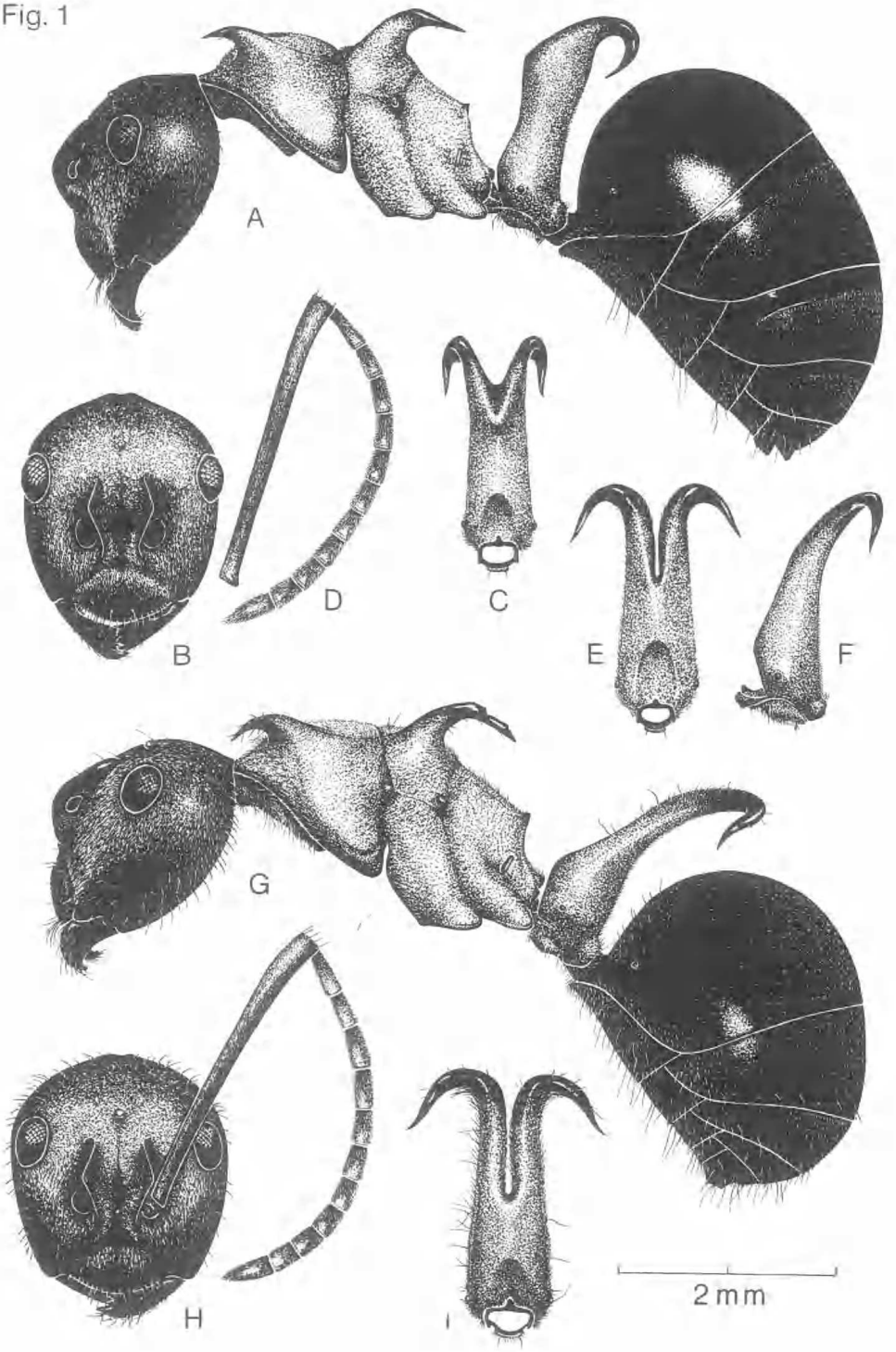

Fig. 2

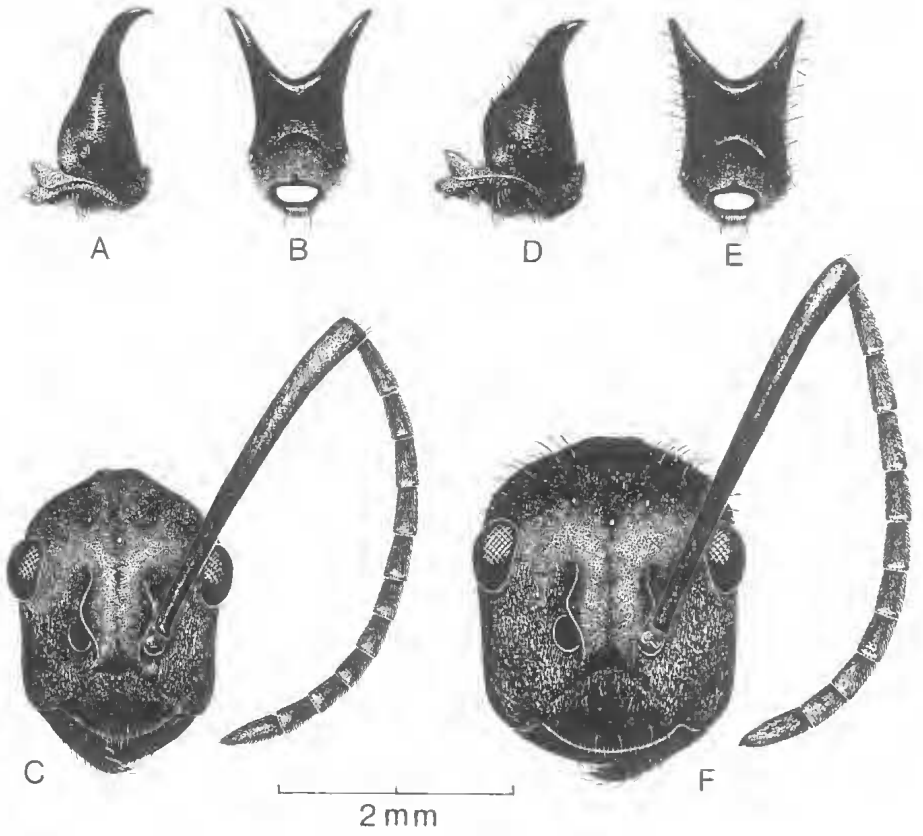

FIG. 1 A–C *P. bellicosa* (holotype): A — lateral view (legs omitted); B — head in full face view: C — petiole (anterior).
FIG. 1 D–F *P. bellicosa* (compared): D — antenna; E, F — petiole, common form (anterior and lateral).
FIG. 1 G–I *P. erosispina* (lectotype): G — lateral view (legs and antennae omitted); H — head in full face view (right antenna omitted); I — petiole (anterior).
FIG. 2 A–C *P. bellicosa* (female): A, B — petiole (lateral and anterior); C — head in full face view (right antenna omitted).
FIG. 2 D–F *P. erosispina* (female): D, E — petiole (lateral and anterior); F — head in full face view (right antenna omitted).

usually separable, no single diagnostic character applies without reservation. A combination of characters has to be considered to differentiate both species successfully, and occasionally they must be identified with less than complete confidence.

The more reliable diagnostic characters are as follows:

P. bellicosa Fr. Smith	*P. erosispina* Emery
generally smaller (HL 1.79-2.12)	generally larger (HL 2.02-2.39).
in full face view, the eyes clearly break the outline of the head (Fig. 1 B).	in full face view, the eyes at most only marginally exceed the outline of the head, but usually do not (Fig. 1 H).
pronotal dorsum distinctly narrowed anteriorly and more or less broadly rounded posteriorly.	pronotal dorsum only very slightly narrowed anteriorly, with the sides almost parallel.
mesonotal dorsum in profile deeply and broadly impressed at the promesonotal suture (Fig. 1 A).	promesonotal suture only very narrowly impressed, the profile flat (Fig. 1 G).
mesonotal spines at their bases almost pyramidal, with the apical portions more or less horizontal and the dorsal edges entire (unless character displacement has occurred (see Fig. 3 A-F).	mesonotal spines from their bases lanceolate, with the apical portions usually recurved, and the dorsal edges frequently eroded (unless character displacement has occurred (see Fig. 3 A-F).
microsculpture very fine, especially on the head and pronotal dorsum; the latter with a glossy, almost polished, appearance.	microsculpture coarser, notably on the head, which is opaque; pronotal dorsum sub-opaque or only feebly shining, without a glossy, polished appearance.
short or medium-long hairs very sparse on mandibles, anterior clypeal margin, posterior face of anterior coxae, subpetiolar process and gastral sternites (pilosity is thus virtually absent from the whole dorsal surface of the body).	short to long hairs usually abundant over the entire body, especially on the head, lateral portions of pronotum, and petiole.

Polyrhachis taylori, sp. nov.
(Fig. 4 A,B,C,D,E,F)

MATERIAL EXAMINED

HOLOTYPE: PAPUA NEW GUINEA, WEST SEPIK PROV.: Torricelli Mts., Lumi, 400–550m, 03.28 S × 142.02 E, 4–13 August 1984, RJK acc. 84.247.

PARATYPES: data as for holotype (638 nidoparatype workers, 16 nidoparatype dealate females and immature stages — eggs, larvae in various stages of development and pupae of workers and females); ditto, RJK acc. 84.249 (8 paratype workers).

TYPE DEPOSITION

Holotype, most nidoparatypes, 4 paratypes and immature stages in ANIC (Type no. 7731); 10 nidoparatypes (8 workers, 2 females) and 4 paratypes in RJK; 4 nidoparatypes (3 workers, 1

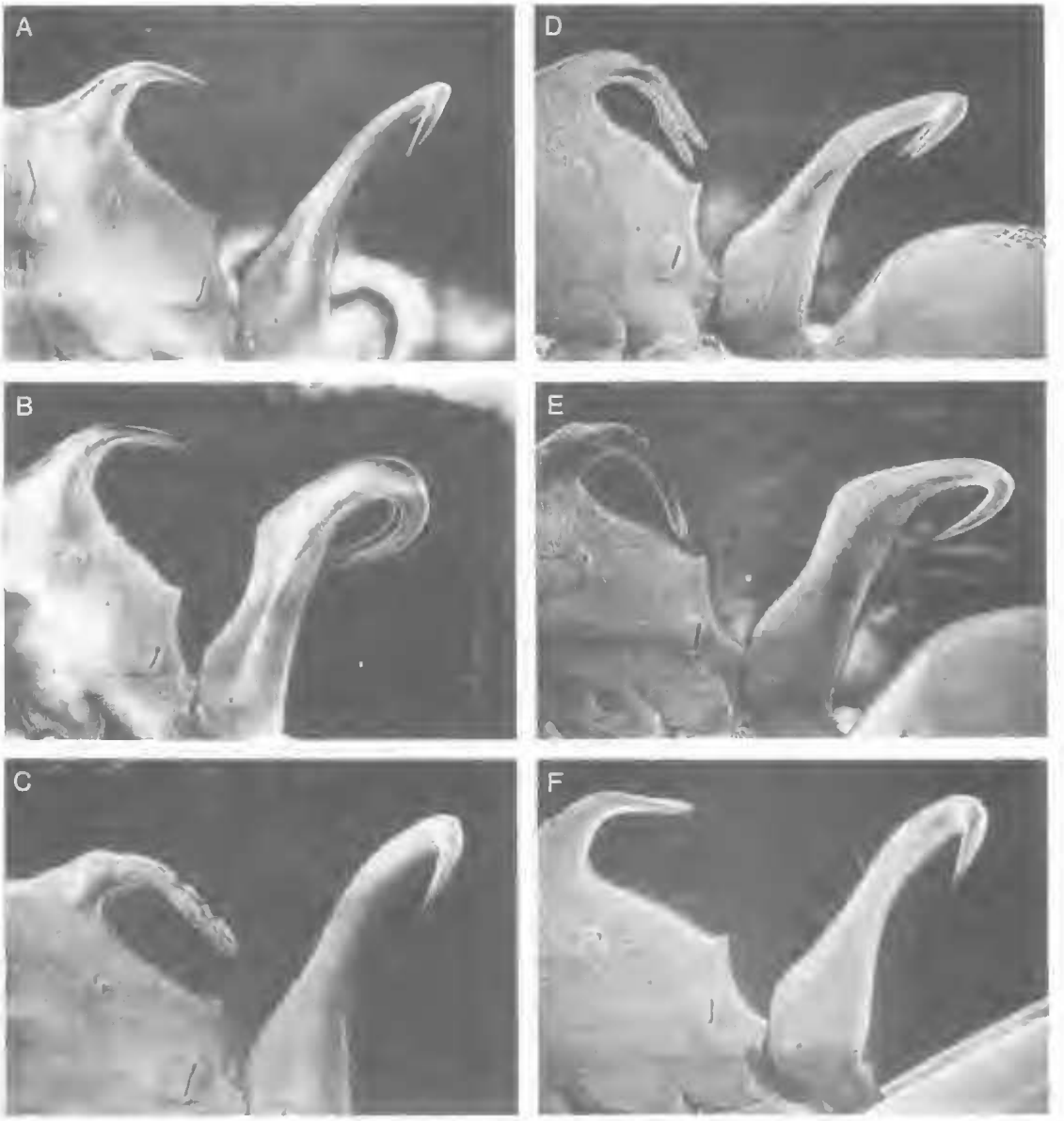

FIG. 3 A–F Scanning electron micrographs of mesonotal spines and petiole of *P. bellicosa* and *P. erosispina* from two different areas of sympatry showing apparent character displacement: A–C, Owen Stanley Range: A, B — *bellicosa*; C — *erosispina*. D–F, Torricelli Mountains: D, E — *bellicosa*; F — *erosispina*.

female) in BMNH; 2 nidoparatype workers each to BPBM, CAS, GMNH, KONE, MCG, MCZ, NHMW, QM, USNM, ZMB, ZSM, ZIK.

WORKER

Dimensions (holotype cited first): TL 7.08, 6.18–7.36; HL 1.70, 1.50–1.75; HW 1.45, 1.29–1.50; CI 85, 82–87; SL 2.21, 1.93–2.34; SI 152, 146–159; PW 0.76, 0.67–0.78; MTL 2.93, 2.56–3.06; PeH 1.40, 1.15–1.50; PeI 82, 77–85 (50 measured).

Mandibles with 5 teeth progressively shorter towards the base. Clypeus convex in profile, not carinate. Sides of head in front of eyes almost

straight, converging anteriorly, rounded behind the eyes. Antennal carinae sinuate, the area between them rather flat, with a weakly defined median longitudinal carina. Antennal scapes exceeding occipital border by approximately half their length. Eyes moderately convex, in full face view breaking the outline of the head. Median ocellus present; lateral ocelli obscure, sometimes lacking. Pronotal dorsum slightly convex in side view; the spines long and acute, projecting antero-laterally, with the tips gently downcurved; outer borders of spines each continuous basally with the rather ill-defined pronotal margin, which terminates at a distinct posteriolateral angle near the promesonotal suture. The latter clearly impressed on the mesosomal dorsum. Mesonotum convex, bearing a pair of pyramidal, rather compressed, posterodorsally projecting spines, with laterally curved tips. Metanotal groove indistinct. Propodeal dorsum weakly margined on each side, the margins terminating posteriorly as medially directed short transverse ridges which partially separate the basal and declivitous faces. Declivity abrupt, shorter than the dorsal face. Petiole columnar, bearing a pair of hook-shaped, transversally flattened spines, more or less divergent from their bases. Gaster eliptical, with first tergite covering less than half the dorsum.

Mandibles shining, finely longitudinally striate-punctate. Head feebly shining, closely reticulate-punctate, with sides less densely sculptured than dorsum. Mesosoma and petiole generally reticulate-punctate, somewhat irregularly reticulate-striate laterally; sculptural intensity reduced on the pronotal disc, which is fairly smooth and shining. Gaster moderately shining, very finely shagreened.

Mandibles, anterior clypeal margin, coxae, subpetiolar process and gaster with sparse, moderately long, sub-erect yellowish hairs. Eyes with numerous short erect hairs. Appressed to sub-erect, short, off-white pubescence abundant on entire body and appendages, without obscuring the underlying sculpturation.

Mandibles, head, antennae, tips of spines, tibiae and tarsi black. Body of mesosoma, petiole, coxae and femora (save for their apical portions) light reddish-brown. Gaster dark reddish-brown, with the base widely diffused with medium reddish-brown colouration. Posterior margins of tergites narrowly black.

FEMALE

Dimensions: TL 8.92–9.47; HL 1.92–1.96; HW 1.43–1.48; CI 73–76; SL 2.71–2.82; SI 185–196; PW 1.18–1.26; MTL 3.43–3.65; PeH 0.94–1.06; PeI 49–54 (16 measured).

Very different from the worker; and with the characters identifying full sexuality — complete thoracic structure and ocelli.

Mandibles with four teeth; the apical tooth 3x longer than those following, which are subequal in length. Clypeus convex in profile, the median portion strongly produced, anterior margin entire, posterior suture distinct, impressed medially, slightly elevated laterally and terminating as a short ridge at the base of the mandible. Sides of the head in front of eyes feebly to distinctly concave, virtually parallel; the cephalic outline strongly converging behind the eyes. Antennal carinae well elevated, more so than in worker; area between them gently concave, with a median longitudinal carina. Antennal scapes extending beyond occipital border by half their length. Eyes relatively large, convex. Pronotum with a pair of short, antero-laterally projecting spines. Mesoscutum quite high anteriorly, with a flat dorsal surface; median line terminating dorsally in a shallow depression; parapsides slightly elevated posteriorly. Mesoscutellum convex, transverse. Propodeal dorsum not marginate, sloping posteriorly to the declivity in an even, medially unbroken curve; posterior angles produced into upturned, medially separated transverse ridges, which do not meet at the midline. Petiole with antero-dorsal face concave, bearing a pair of slender, relatively long, widely diverging spines. Gaster elongated, elliptical.

Mandibles finely longitudinally striate-punctate, with numerous piliferous pits. Clypeus finely punctate. Head reticulate-punctate, the sculptural intensity increasing to coarse on vertex and occiput; moderately shining. Mesosoma and petiole reticulate-punctate, sculptural intensity increasing dorsally, with mesoscutum subopaque. Gaster microscopically reticulate-punctate, moderately shining.

Pilosity very sparse, consisting of short to medium long, sub-erect yellow hairs on mandibles, anterior clypeal margin, posterior faces of anterior coxae, subpetiolar process and posterior margins of terminal gastric tergites and sternites. Very short, fine, appressed yellow

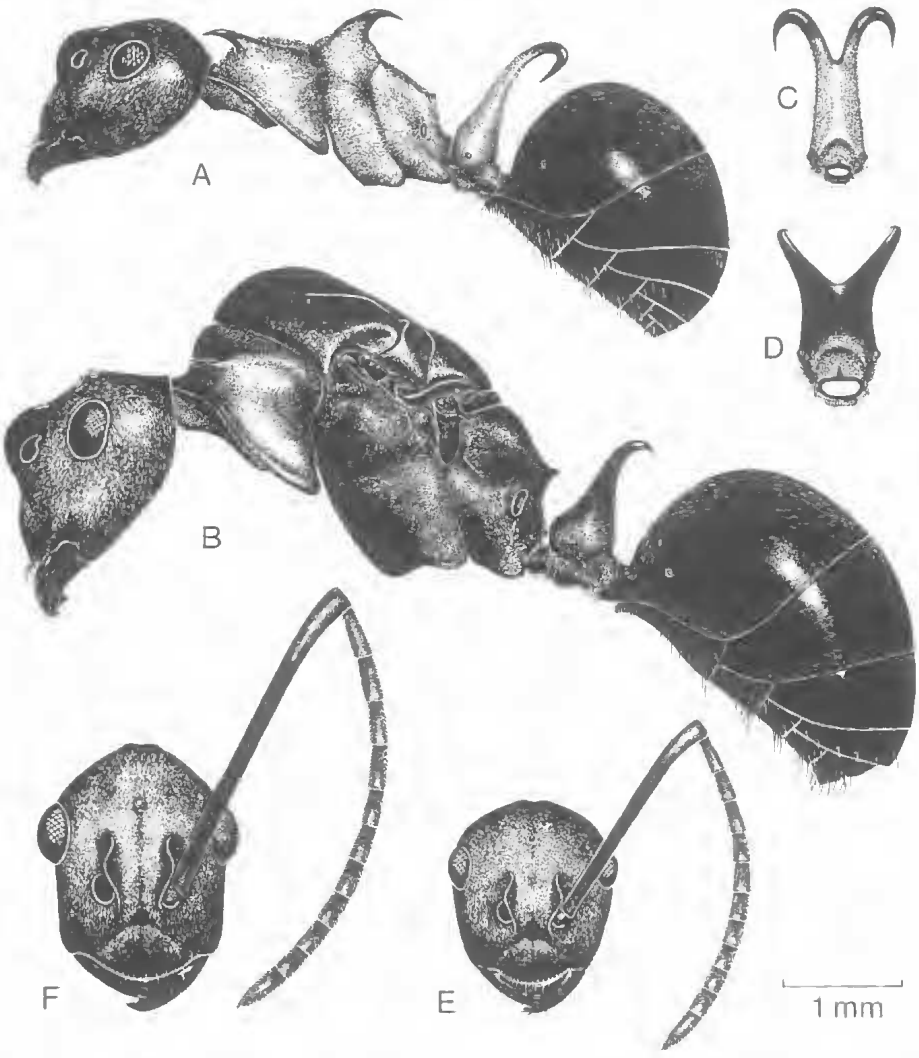

FIG. 4 A–F *P. taylori* (holotype worker and nidoparatype female). Lateral view (legs and antennae omitted): A — worker; B — female. Petiole (anterior): C — worker; D — female. Head in full face view (right antennae omitted): E — worker; F — female.

pubescence abundant all over the body and appendages.

Mandibles reddish-brown, bordered with black. Head and body largely black, with a reddish-brown cast on the neck, lateral portions of pronotum and on sides of petiole below stigma, except subpetiolar process, which is black. Antennal scapes, coxae, femora and tibia medium reddish-brown, somewhat infuscated dark brown, with femora a shade lighter; tarsi black. Gaster black with lateral margins of tergites and sternites infuscated dark reddish-brown.

MALE

Unknown

Immature Stages

Eggs off-white, elongate-elliptical, 0.31–0.34 × 0.81–0.87 mm. Larvae with long, hook-terminated hairs. Pupae enclosed in cocoons.

P. taylori is easily recognisable by its small stature (HL < 1.75), which is well below the size of the smallest known *bellicosa* and *erosispina* specimens (HL > 1.80). The petiolar index in *taylori* is relatively low (PeI < 85) and the spines are more or less divergent from their bases. In *bellicosa* and *erosispina* the petiolar index is always higher (PeI > 85) and the spines are parallel for most of their length. These two species are common and widespread throughout Papua New Guinea, but *P. taylori* is known only from its type locality.

BIOLOGY AND OBSERVATIONS

Workers of *P. taylori* were first recognised foraging over felled trees in a native garden established in a clearing of primary forest. They were immediately conspicuous because of their small size. By tracking returning foragers the colony was located in a dry bamboo stick serving as a land marker, topped with a piece of black plastic sheeting. The nest occupied three adjoining internodes of the bamboo, and the only silk employed in its construction formed an ultra-thin lining on the walls of the cavities, and a small opening surrounded by the thickened bamboo node at the top, beneath the plastic cover. The colony was collected entire and comprised 639 workers (many of them callows), 16 dealate females and numerous immature stages, including eggs, small and large larvae and pupae of workers and females. A few additional specimens were collected from a second nest located under much the same circumstances in a nearby bamboo marker.

Besides *P. taylori*, the most common foragers in the surrounding area were the workers of *P. erosispina*. A nest of the latter was located on the edge of the primary forest, some 1.5m above the ground. It measured approximately 20cm in diameter, and was constructed between twisting multi-stems of a woody liana and the adjacent tree trunk. Its walls incorporated the foliage and shoots of an abundant tendril climber. This nest followed the basic structural design observed in *erosispina* throughout Papua New Guinea, and was typical in its situation in the lower arboreal zone. In areas with abundant bamboo growth *erosispina*, together with many other *Polyrhachis* species (of subgenera other than *Polyrhachis*), normally nests in bamboo internodes, much as was the case with the *P. taylori* type colony.

The nests of *P. bellicosa* are somewhat similar to those of *P. erosispina*. They are, however, always situated relatively high in the vegetation, often some 3 to 5m above the ground. A few have been observed between clumped leaves of bamboo, but the great majority are constructed between lianas and other climbers pressing against tree trunks. The walls of these nests are normally supported by a strong network of tendrils from surrounding climbing vines, and incorporate other vegetation debris bounded with yellowish-brown silk. Some of the nests observed were quite huge. One in particular measured close to 50cm across and must have contained thousands, if not tens of thousands, of ants. The surrounding vegetation and forest floor was virtually covered by a network of trails with numerous foraging workers.

Regardless of colony size, dissected nests of *P. bellicosa* and *P. erosispina* always contained only one queen. The *P. taylori* type-colony on the other hand contained sixteen apparently reproductive females. Unfortunately field conditions did not allow for dissection and study of ovarian condition in these individuals.

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